

# Keynote: Planning for Career Satisfaction and Success

**Lesley Earl, Ph.D.**

"What do you want to be when you grow up?" During the keynote session for the 2011 Graduate and Professional School Fair, Dr. Lawrence Tabak, Principal Deputy Director of the NIH, called those words "the ten words that inhibit career development more than any other." There is a belief, especially among those just starting their careers, that there is somehow a perfect and correct answer to that question. "You freeze when you hear that," Dr. Tabak said, because you think "that when you make a choice that it's forever, because you want everything to be perfect. So you dare not make a choice, lest it not go well, because it's going to be forever."

Happily for those of us who sit at a crossroads, attempting to steer our career paths, Dr. Tabak concluded, "that is a bunch of hooey." The choices that you make now, whether to enter graduate school or professional school, or to take a few years in the workplace first, are not final. A satisfying and successful career is always a work in progress, with unexpected turns and bumps in the road. Dr. Tabak offered a simple equation for success: hard work ("perspiration, not inspiration") plus not being afraid to fail ("[Have you] ever failed an exam? And you're still alive!"), times "that mentorship thing" (and not just one perfect mentor, but as many mentors as you need).

When you're starting out, you might wonder why a senior scientist, or someone well established in their career, would be willing to mentor you. Deputy Director Michael Gottesman answered that question, saying, "The best legacy we can possibly leave. . . is by mentoring students like yourselves in the audience, and convincing [them] that this is a career more satisfying than almost all others." A good mentor-mentee relationship is rewarding to both parties. As long as you show genuine interest and nurture the relationship, the right mentor will gladly guide you, advocate for you, and help you to explore your potential and exploit your strengths. While self-knowledge is key to finding a fulfilling career path, mentors - whether they are in your chosen career path or not - can provide invaluable assistance in achieving your goals.

"There are people who wake up every morning totally jazzed about their jobs, and that's what we want for every one of you," said Dr. Sharon Milgram, Director of OITE. Achieving both success and satisfaction in your work will take constant reevaluation of yourself and your goals, and the courage to learn from your mistakes. And if you haven't quite figured out what you want to be when you grow up? Try things on, see what fits, play to your strengths, and be open to guidance by all the mentors in your life.

# Getting to Medical School

by Brenda Kostelecky

Applying to medical school can be an exhausting process, and it is difficult for candidates to know what will give them an edge in the admissions process. The “Getting to Medical School” session at the NIH Graduate and Professional School Fair was designed to give aspiring medical doctors some insight into what admissions committees look for in medical school candidates. Expert panel members from medical schools, including Stanford University, University of Alabama and Philadelphia College, provided valuable insight to those planning to apply for MD and DO programs.

While many prospective students obsess over having the highest grades and standardized test scores possible, the panelists agreed that these metrics don’t guarantee admission and that other attributes are often more important. Medical schools award interviews based in large part on a candidate’s ability to demonstrate skills that are characteristic of good clinicians. Contributions to the community, extracurricular scholarly activities and efforts to enrich the diversity of the academic environment can all add to an applicant’s appeal. Candidates who demonstrate clear leadership skills and have undertaken projects with depth have an advantage over those who have participated in many activities, but have taken on little responsibility.

The ability to articulate why you are applying to a particular medical school is crucial. Different medical schools have diverse guiding principles including driving cutting-edge research, educating students in the osteopathic tradition, or combining health and behavioral sciences. If your goals do not clearly align with the school’s mission, then you have little chance of being invited for an interview. Students in the audience were encouraged to read schools’ mission statements, determine if the mission fits their needs and then clearly state how their goals are compatible in their personal statement.

Letters of recommendation can be the critical factor determining whether or not a candidate gets an interview. Applicants should carefully cultivate relationships with faculty and with mentors they meet through volunteer work. Recommendations from people who can speak at a personal level about a candidate’s leadership qualities and specific contributions to a project can help to convince admissions staff that an applicant will substantially contribute to their program.

The panelists also emphasized the importance of details that candidates may consider minor, but that can significantly impact their chances of being invited for an interview. Candidates should be aware of when the application cycle starts, in

order to submit their primary application as early as possible. Admissions staffs review applications as they come in and often have more interview-worthy candidates than interview spots left at the deadline. Another small, yet significant factor is being responsive to requests from admissions faculty. Once a secondary application or other document is requested, candidates should respond within 72 hours to clearly demonstrate their interest.

Although there is no silver bullet to getting into medical school, applicants have the greatest chance of gaining admission if they are able to build a picture of themselves as candidates who are academically ready, have strong leadership skills, and will substantially contribute to a school's mission.

## **Getting to Graduate School - PhD training and applications**

**Lesley Earl, Ph.D.**

"You earn a PhD for discovering something new. ... This has been the definition of the PhD since the times of the medieval university," says Victoria Freedman, Assistant Dean for Graduate Studies at the Albert Einstein College of Medicine. If that's what inspires you, making a unique scientific contribution to our body of knowledge, then graduate school may be for you.

The Getting to Graduate School session was given by a panel of graduate school admissions experts, and offered an in-depth look at the particulars of the graduate school application. Getting to graduate school is a year-long process; it includes several key components, each with specific deadlines. The first piece of this process is to answer this question: what kind of program are you looking for? With nearly 600 PhD programs available, choosing the right program means deciding what kind of science you're interested in and how you want to approach it. For instance, you might want a graduate program tied to a specific department, an interdisciplinary program, or you might choose flexible umbrella program. Each type of program, and indeed each school, offers unique advantages.

When preparing to apply to graduate school, choose your recommenders with care. The panelists agreed that you should ask for letters from people who are familiar with you as a researcher, as graduate schools want to know you in that capacity. This leads us to a key point: most schools weigh undergraduate research very heavily. It's good to have several summer research projects, but a senior research project culminating in a thesis is even better. If that's not possible, consider a year as a postbac or technician to boost your research experience - and help you decide if a career in research is really for you.

The most important element of your application is your personal statement. Dr. Nancy Schwartz, Associate Dean and Co-director of Graduate Affairs at the University of Chicago, explained, "[The personal or research statement] is probably the most important thing that admissions committees will look at... This is your opportunity to describe who you are, why you want to go to graduate school, and what you have done to prepare for graduate school." The personal statement is also your chance to overcome any deficiencies in your application (like those stubborn low GRE scores or that pesky physics grade), and where you can highlight experiences outside of the classroom. Dr. Joseph Barbieri, Director of MSTP at the Medical College of Wisconsin, offered his advice as well; "It's not enough to say that you like to do research. You have to be able to take the experiences that you've had, and convince somebody... that you have the aptitude and the wherewithal to conduct PhD quality research."

After your applications are in (watch those dates, as they can come as early as November), rolling interviews begin. At your interview, two processes will go on simultaneously: they will be interviewing you, and you will be interviewing them. The interviewers will want to determine whether you can talk about your research in its greater context, and whether you can synthesize and discuss research that is not your own. At the same time, they will be trying to recruit you into their program. While interviewing, ask yourself, is this school the right fit for me?

Finally, Dr. Freedman made one last very important point: "All of the sciences, whether you are doing physical sciences, engineering, chemistry, basic biological sciences, any kind of science, can come back and be used to answer questions about health and disease, and ultimately to help us reach our goal of improving human health." Should you decide to enter a PhD program in any field, the new and unique knowledge you will generate will be a contribution to your field, the greater scientific community, and ultimately to human health.

## **Psychology: From Admissions to Career Opportunities**

Drs. Laura Koehly and Kim Nickerson spoke to an audience of trainees, postbacs, and grad students at the NIH Graduate and Professional School Fair. They each began with an overview of their backgrounds and careers, and then spent the bulk of the session answering questions that focused on admissions and grad school success.

Koehly, an NHGRI senior investigator and Head of the Social and Behavioral Methods section of the Social and Behavioral Research Branch, develops and applies social network methods in studying social systems such as families and communities. She described how she initially studied clinical psychology thinking she wanted to go into direct practice, but ultimately found herself drawn to observing families and conducting research, rather than providing direct service.

Nickerson, an Assistant Dean in the University of Maryland College of Behavioral and Social Sciences, has research interests that include both health disparities and the social, legal, and ethical implications of genomics in minority communities. He described a career that focused on direct clinical psychology practice in many populations and settings, such as work in hospitals, prisons, clinics, and universities. He segued into academia after postdoctoral research on racial identity and cultural mistrust.

Questions about applying to psychology programs included how to figure out where to apply, which labs/researchers to work with, the necessity of gaining certain kinds of research experience, and what to focus on in the actual application. The speakers highlighted the following:

### *Selecting a Program/Lab*

The American Psychological Association Web site provides an overview of different psychology careers. This resource can help applicants confirm that they are applying to programs that are a good fit.

Do what excites you. There are sometimes several different programs that will fit your needs. Be open and flexible. What you choose to focus on in your graduate work may or may not end up being what you ultimately work on, and that's OK.

When choosing a research group, it is essential to consider your personality and research interests, and not just the academic reputation of potential mentors. There are no right or wrong answers when choosing a lab, but be sure to think carefully about all considerations. Do your research and talk to current trainees before making a decision.

### *The Application Process*

It is imperative to get very positive, specific recommendation letters from people who know you well.

You can't predict exactly what each admissions committee will want. Each may place variable weight on different admissions factors. Focus on telling the committee about your unique interests and skills—don't just tell them what you think they want to hear.

Admissions to PhD programs from MA programs may be more rigorous, as the committee may expect applicants to have filled gaps in their undergraduate work or to have demonstrated a clear interest in a specific future direction. MA applicants should keep this in mind as they prepare their applications.

### *During Training*

Find a blend of what excites you and what fits well with faculty research projects.

Take advantage of mentoring. Build relationships with faculty and peers.

## **MD/PhD: Is It for You?**

**by Brenda Kostelecky, PhD**

Many aspiring doctors aim to combine caring for patients with advancing the frontiers of biomedical science. The “MD/PhD: Is It for You?” session at the NIH Graduate and Professional School Fair was targeted at those participants who are interested in pursuing both medicine and research. The panel of experts included several MD/PhD professionals from schools including the University of Iowa, University of Rochester, George Washington University and University of Alabama. The panelists provided information about the options available to those interested in both medicine and research, presented advantages and disadvantages of MD/PhD programs, described key skills and attributes MD/PhD admissions staffs look for, and identified criteria candidates should use to choose the best program for them.

One route to training for both medicine and research is to first complete a medical degree and then apply for a research-based residency. Another path, though less commonly taken, is to complete the MD and PhD degrees separately. One of the most common paths to becoming a medical researcher is to pursue both degrees simultaneously through a specialized MD/PhD or DO/PhD program.

A key advantage of MD/PhD programs is that they are designed to integrate medicine and research so that students have solid skill bases in both fields. This dual emphasis often provides students with stronger research knowledge and exposure than their peers who complete an MD followed by a research-based residency. One perceived advantage of MD/PhD programs is that they provide tuition and stipend support. Panelist Dr. Robin Lorenz cautioned, however, that students should not base their decision on the funding factor alone. Although MD-only students incur significantly more debt, they also begin earning high salaries earlier, which can negate the financial downside of the MD option.

There are some similar attributes that both MD and MD/PhD admissions staffs look for in candidates. Academic excellence and MCAT scores are important for both types of program, but additional factors can weigh equally heavily. Extracurricular activities that demonstrate maturity, integrity and solid leadership qualities are critical for both MD and MD/PhD applicants. One key difference for MD/PhD admissions is the emphasis on research experience. Involvement in prior research projects is vital, because it demonstrates familiarity with testing hypotheses and coping with the ups and downs of research work. Research experience can be gained during summer internships, by completing a senior undergraduate thesis project, or by getting post-baccalaureate experience in a research lab. Strong letters of recommendation from research mentors will help establish a candidate's potential as a clinical researcher.

The panelists suggested that candidates carefully evaluate their own needs when choosing a training program. The quality of the research, curriculum, faculty, and alumni achievement are all important considerations. Prospective students should be aware that the PhD component of an MD/PhD can be earned in a variety of fields including the biomedical sciences, engineering, bioinformatics, epidemiology, or social sciences. Students can thus choose a program that fits their scientific interests. The school's location can also be a significant element, and may factor strongly for students with family considerations. Perhaps most importantly, candidates should go where they feel a sense of good fit, because that place will be their home for the better part of a decade.

The panelists concluded that there is no single "right way" to become a clinical scientist and that there are many viable routes to combining medicine and research. Students should choose which path works for them based on their own circumstances and should be open to exploring both conventional and unorthodox routes to achieving their professional goals.

## **Public Health: From Admissions to Career Opportunities**

### **Lesley Earl, Ph.D.**

When you think of public health, what comes to mind? Is it policy makers on the Hill? Or aid workers in rural Africa? How about researchers at the CDC tracking a pandemic flu outbreak?

All of these people fit under the umbrella of public health. At the NIH Graduate and Professional School Fair, we heard from panelists who work in the public health field. John E. McElligott, Public Health Policy Analyst at the Association of Schools of Public Health, described the breadth of the field: "Public health is local, state communities, federal level, international... Public health workers serve a lot of populations." Because of this, the positions available to someone with a Masters in Public Health (MPH) degree are highly diverse. They span the globe and cover health issues from heart disease to sanitation, from seatbelts to malaria. The overall purpose of the public health field is to improve the safety and health of populations, rather than individuals. Because of this, "a lot of public health is driven by policy. We try to collect the data in the field, and then we try to bring it up to the level where policy makers at the state, local, or federal level will institute policies to prevent disease," continued John McElligott.

So why would one choose public health over a field like medicine? Dena Freeman, Clinical Research Coordinator at Children's National Medical Center, put it this way: "I was more interested in how people relate to science, and how science and health affect people." If you like the idea of making a difference, and are interested in working to limit morbidity and mortality for whole populations, consider attending a program in public health.

Because of the diversity in career paths within the public health field, it's important to choose a School of Public Health that's a good fit for your needs. Jeffrey Dubinski-Neessen of the Boston University School of Public Health Admissions Office shared his advice: when considering graduate school, "thinking through the different opportunities at a School of Public Health will help you along your way." Each school has a unique emphasis and a different approach to the field. Some programs focus more on classic subjects, like epidemiology and statistics, while others branch out into ethics, business, law, policy, and economics. Furthermore, there is a range of degrees offered at Schools of Public Health. While the MPH is the most common public health degree, more research-focused degrees like the Masters of Science and PhDs are also available. Another option is the Doctorate in Public Health (DrPH) degree, which may be useful for those interested in leadership in the public health field. Consider your intermediate and final goals when choosing a graduate program in public health. For instance, think about whether you want to focus on research, on working directly with populations, or whether you are interested in a leadership position. Finally, when selecting a graduate program, keep in mind that many organizations, including state and federal governments, will only hire job candidates with degrees from schools or programs that are accredited.

If you can see yourself in any of the diverse public health jobs out there, and intend to apply to public health graduate programs, take the time to gain experience in the field. Either paid work or volunteer experience will help you decide where your passions lie and whether you want to work at home or abroad, in the field or in the office, in policy or in implementation. When you are ready, a degree in public health can be the first step towards making a difference, improving the health and well-being of people all around the globe.

## **Dental School Admissions: What You Need to Know**

Do you seek to serve society as a health science professional? Are you looking to manifest your scientific training into an artistic endeavor? Do you have a keen eye for detail? If so, then perhaps dentistry is the profession for you! However, dental school admissions are highly competitive. According to the American Dental Association, there were 13,742 applicants in 2007, yet only 4,733 first year enrollments. Thus, on average, only one in three applicants are admitted to dental school. In order to help you navigate the process of dental school admissions, Dr. Patricia Meehan spoke at the NIH Graduate and Professional School Fair, offering her advice for successfully applying to dental school.

Dr. Meehan is the Assistant Dean for Admissions and Recruitment at the University of Maryland School of Dentistry. She has extensive experience in dental school

admissions. After originally receiving her degree in nursing and kinesiology, and subsequently working as a nurse in the NIH Clinical Center, she made a mid-career transition into dentistry.

Dr. Meehan emphasized that before considering dental school, it is imperative that you shadow a variety of dental practices and disciplines. Simply shadowing one dentist or practice is not sufficient. You must shadow enough to develop an understanding of the contemporary issues of dentistry. There is a broad diversity in the types of dental practices ranging from small “mom and pop” family practices to the most innovative technical dentistry. Dr. Meehan stressed it is the “quality of the shadowing, not so much the quantity.” Your shadowing experiences should demonstrate to the admissions committee that you have “a good working knowledge of a life and career choice” in dentistry. She emphasized that shadowing will allow you to learn about the different kinds of dentistry such that you can discover the “kind of dentist you will be.” Furthermore, Dr. Meehan noted that her own decision to transition into dentistry resulted from her own shadowing experiences

Now that you have shadowing experience under your belt, you are ready to apply for dental school. You can find all the information online from the [American Dental Education Association \(ADEA\) Associated American Dental Schools Application Service \(AADSAS\)](https://portal.aadsasweb.org/) at <https://portal.aadsasweb.org/>. ADEA provides an extensive guide to the majority of all American dental schools and will provide you instruction on how to submit your AADSAS application. Although seemingly daunting, Dr. Meehan reassured applicants that the key is to gather as much information as possible and to submit early!

Another important component of your AADSAS application is the recommendation section. Your recommendation letters should be written by health professionals who know you well and can speak to your abilities and potential for success in dental school. Dr. Meehan suggested that a polite way to solicit recommendation letters is to ask, “Do you think you know me well enough to write me a strong letter?”

Once you have submitted your AADSAS application, you will wait to hear about an interview. Dental schools begin interviewing candidates on a rolling basis. The interview is a two-way street: it is an opportunity for you and the school to get to know each other and find that win-win teaching relationship. Dr. Meehan recommended being well-prepared in advance, such that you can be “relaxed enough to present yourself and your strengths.” This includes anticipating

questions about your interests in dentistry and the specific dental school program, and having answers ready. She also highlighted important aspects of effective self-presentation, such as your appearance, posture, eye contact, handshake, and other non-verbal cues.

Dental school can be the first step in the path to a highly rewarding profession. With the proper preparation, you can be a strong dental school candidate. In closing, Dr. Meehan reminded applicants to “Smile... it’s a dental school!”

Lillian Kuo is a postdoctoral fellow at NCI-Frederick in the HIV Drug Resistance Program. She received her Ph.D. from UT Southwestern and her B.S. from the University of Wisconsin-Madison. She is globally interested in the roles of host cellular proteins in HIV-1 pathogenesis.

## **Interviewing: Preparation and Performance**

If you find the grad school or medical school interview to be the most intimidating part of the application process, you’re not alone. However, as Dr. William Higgins revealed at the NIH Graduate and Professional School Fair, interviewing doesn’t have to be torture. Preparation and self-knowledge can make all the difference, transforming a nerve-wracking, make-or-break performance into a chance to show off your accomplishments and convey your enthusiasm. Dr. Higgins is an Associate Professor of Biology at the University of Maryland and is a Pre-Professional Advisor with the NIH Office of Intramural Training and Education. He offered tips for how to ace your interviews.

“I want you to go home, I want you to look in the mirror, and I want to figure out if you think you’re good enough.” This was Dr. Higgins’ opening salvo, and the rest of the seminar was just as provocative. Interviewing, he said, is all about marketing yourself. You have to know that the product you are selling (yourself) is going to enhance the program you are applying to. There are two types of people in the world, he stated, those who thrive on adrenaline and high stress situations, and those who wilt. If you’re the latter, he advised the audience, you won’t make it in medical or graduate school.

According to Dr. Higgins, there are four components of a great interview: preparation, confidence, enthusiasm, and conversation. Fortunately, successful preparation can be achieved through carefully studying the program and practicing what you intend to say, and confidence and enthusiasm will come naturally to a

well-prepared candidate. He outlined several key aspects of strong interview preparation, including knowing who you are going to meet, becoming familiar with the program by reading the Web site, ensuring that you can talk about everything you wrote in your application, and rehearsing your answers to common questions.

On interview day, you put it all together to convince the interviewer that you are knowledgeable, prepared, enthusiastic, and a good fit for the school. Be positive, Dr. Higgins stressed. Be gracious and appreciative toward everyone you meet there, including the clerical and administrative staff. Dress business casual (for women, that means shoes you can actually walk in!), and turn off your cell phone. Most of all, try to convince the interviewer that even if you have multiple offers on the table, you are going to pick their institution. You can do this by making sure to nail down details before you leave. Ask when you can expect to hear their decision, when classes start, and for graduate schools, ask what kind of stipend you can expect. “If you don’t leave with those answers,” Dr. Higgins warned, “you’ve messed it up.”

Remember, Dr. Higgins stressed, you and the interviewer have the same goal: to figure out whether you are a good fit for the program. Therefore, an interview can and should be more of a conversation than an interrogation. Leave the nerves at home, and don’t look at the interviewer as an antagonist. Just take a deep breath, remember your preparations, and relax. If you’ve made it to the interview, you’ve already put in a lot of hard work. Now is the time to show it all off.

## **Fellowships for PhD and MD/PhD Students**

One of the initial steps in a successful scientific career is to secure funding. Winning a training fellowship as a graduate student is a great way to launch a scientific research career and really hit the ground running. Even as an undergraduate, you can begin applying for fellowships to fund your PhD or MD/PhD training. At the NIH Graduate and Professional School Fair, three grants management panelists spoke of the many fellowship opportunities available for students and early career scientists.

Dr. Michelle R. J. Hamlet, Program Director at the National Institute of General Medical Sciences (NIGMS), presented extramural NIH funding opportunities for PhD and MD/PhD trainees. She discussed the [NIH RePORTER website](#), a comprehensive resource providing a wealth of information, including data and analysis of the NIH research portfolio. Dr. Hamlet also introduced two types of extramural training grants available to predoctoral students: the T32 and F31/F30 grants. An important

caveat with both grants is that they are only available to U.S. citizens and permanent residents. The T32 grants are institutional training grants awarded to graduate or medical schools. The schools select students to be funded through the fellowships. In contrast to the institutional training grants, F31 and F30 are individual predoctoral training grants for PhD and MD/PhD students respectively. These F31/F30 grants focus on the research training and development of the student, requiring the student and his/her mentor to work together in writing the fellowship application. These are highly competitive and prestigious awards, however the success rate for fiscal year 2010 was about 30%.

The next panelist, Dr. Gisele Muller-Parker, represented the National Science Foundation (NSF) Graduate Research Fellowship Program (GRFP). The NSF GRFP is one of the oldest and most renowned graduate fellowship programs. The GRFP is over 60 years old, and has funded over 46,000 research fellows. The goal of the NSF GRFP is to promote all disciplines of science, technology, engineering and mathematics (STEM) education and to ultimately support “the nation’s next science and engineering workforce.” The GRFP is unique in that the award is given to the student and thus the student has the flexibility to take the award to any institution. Undergraduate students are specifically encouraged to apply for the award prior to application to graduate school. However, students are still eligible during their first and second years of graduate school. Dr. Muller-Parker recommended that students visit the [NSF GRFP FastLane homepage](#) to find information about the award and application process.

The final speaker was Dr. Theresa J. Miller, Scientific Officer at the Congressionally Directed Medical Research Programs (CDMRP). The CDMRP funds medical research in 17 different areas including breast, prostate, and ovarian cancers, neurofibromatosis, traumatic brain injury, and military health. Dr. Miller emphasized that unlike the grants given by the NIH and the NSF, the CDMRP research pipeline is focused on the “development of an idea,” and not so much on the career stage of the awardee. As an example, she described the Teal Predoctoral Scholar Award for ovarian cancer research. The Teal awards fund all areas of ovarian cancer research, including predoctoral research, with the goal of supporting “the next generation of ovarian cancer investigators through mentored research training.”

Altogether, there are a myriad of fellowship opportunities available for graduate and medical students. The key to navigating the complicated application process is to be organized and informed about the fellowships available. The scientific program officers from the various funding agencies can work with students and guide them through the application process. All of these fellowships support and

enrich the education and training of future PhD and MD/PhD research scientists. Successfully securing research funding is a remarkable achievement that will undoubtedly catapult any scientific career.

Lillian Kuo is a postdoctoral fellow at NCI-Frederick in the HIV Drug Resistance Program. She received her PhD from the University of Texas Southwestern and her BS from the University of Wisconsin-Madison. She is globally interested in the roles of host cellular proteins in HIV-1 pathogenesis.

## **Pharmacy: from Admissions to Opportunities**

“Pharmacists are the most accessible health care provider,” stated Dr. Cynthia Carnes, PharmD PhD, Associate Dean for Graduate Studies and Research at the Ohio State University College of Pharmacy, speaking on the “Pharmacy: From Admissions to Career Opportunities” panel at the NIH Graduate and Professional School Fair. This may be one reason for the popularity of pharmacy school among college graduates considering professional training. Another reason is that there are plenty of job opportunities for pharmacy school graduates. In addition to the typical positions found in community pharmacies or hospital settings, pharmacists can specialize in administration of vaccines, sterile preparation of medication for hospital use, medication management therapy for diseases such as diabetes and hypertension, or preparation of radioactive pharmaceuticals. Accessing any of these career options requires a minimum of four years at pharmacy school to receive the PharmD degree.

There are approximately 100 pharmacy schools in the US, and they are all fairly competitive, so ample preparation is required to put together the best application possible. Margaret Hayes, MS, Director of Strategic Initiatives at the University of Maryland School of Pharmacy also participated in the panel. She recommended applying to pharmacy school at least one year prior to your targeted matriculation date, but noted that you should start researching programs as soon as you know that you are interested in pharmacy. It is important to make sure that you have completed the required prerequisite classes, and that you have the minimum GPA (generally 3.0) to be accepted. If you start early, you can use your senior year to fill in the prerequisite gaps and retake a class if you need to improve your GPA. Many schools also require a minimum score on the pharmacy-specific PCAT test or standard GRE exams, so investigate the different requirements for each school and begin studying well ahead of time. Become familiar with PharmCAS, the universal online application site, and begin compiling your transcripts, personal statements, and letters of recommendation on that site. Many pharmacy schools accept students on a rolling basis, so getting your application in early may help.

Once you have made it to the interview stage, begin practicing communication skills.

Pharmacists are the interface between the doctor and the patient, so being able to relate to people and communicate efficiently is of utmost importance. Pharmacy schools look favorably upon applicants who have firsthand experience in a community pharmacy or have shadowed pharmacists, so be sure to seek out these opportunities to learn more about the career. Prior to the interview, read about current topics in healthcare, pharmacy, and public health, so you can demonstrate comprehensive knowledge of the industry. Most importantly, pharmacy schools want to know why you want to be a pharmacist, so be certain to have a good answer prepared.

After you arrive at pharmacy school, expect the first few years to be primarily science-based classroom education. The third year of pharmacy school starts to encompass experiential learning in addition to didactic teaching, and the fourth year consists entirely of site-based pharmacy rotations. Combined degrees are gaining popularity among pharmacy students. Many PharmD candidates pursue joint MD, PhD, MPH, or JD degrees. Other PharmD recipients seek post-graduate research options such as a one-year clinical residency or a two-year combined Health System Administration masters degree and residency. These additional options can lengthen the time in training, but can pay off in the long run with more diverse and interesting job opportunities.

Whether you receive a combined degree or a PharmD alone, becoming a pharmacist can be a very rewarding option, both financially and personally. Applying your scientific interests to the practice of improving health care for patients can provide a career's worth of satisfaction

## **Making the Transition to Professional School**

How do you know when you're ready to go to medical school? Some students go immediately after college graduation, whereas others spend a year or two sharpening their skills with master's programs, self-study, or volunteer work. According to Dr. Gabriel Garcia, Associate Dean for Medical School Admissions at the Stanford School of Medicine, there's a simple way to recognize when the time is right. "When you're ready to be an adult learner, you're ready to come." Dr. Garcia spoke about making the transition to professional school at the NIH Graduate and Professional School Fair. He focused his session on learning strategies and attitude, and he welcomed many questions from the audience.

Learning at the professional school level is more independent than learning at the undergraduate level. Dr. Garcia pointed out that professional education consists of never-ending amounts of new material, constantly building on your existing knowledge. Moreover, you are expected to not only memorize the material, but to understand it fully such that you can explain and apply it.

Because the amount of material can be so overwhelming, you must take an active role in your learning. Instead of using the classroom as a place to learn, teach yourself before coming to class, and then use the class time to clarify things you didn't understand on your own. Be self-aware, and test your own knowledge by explaining the material to others. If you can't explain it, Dr. Garcia declared, you haven't really learned it. Time management is critical. Don't drop all of your extracurricular activities, he advised, but limit them such that you can "achieve excellence in everything you do." Not balance, he stressed, but excellence.

Several members of the audience asked about problem-based learning, or PBL. Schools use it, Dr. Garcia acknowledged, and it's excellent training for the case-based problem solving that doctors do on the job. However, it need not be intimidating. He suggested taking participation-based courses in college that include small group learning in order to gain experience. Moreover, material in medical school is presented in an overlapping manner in different formats, such as lectures and team learning. Once you're there, you'll figure out which suits you best.

Asked about the advantages and challenges of approaching professional school from a humanities background, Dr. Garcia pointed out that he himself majored in comparative literature as an undergrad, and that this has influenced how he approaches patient care. He feels that his humanities background allows him to more fully appreciate his patients' stories and thus individualize their treatment plans, and that this has been especially helpful in end-stage care. He cautioned that humanities majors should make absolutely sure that they have mastered the relevant scientific competencies before they arrive. These competencies can be found in the "Scientific Competencies for Future Physicians" report compiled by HHMI and AAMC. Additionally, he pointed out that that all applicants can increase their competitiveness in the admissions process by doing volunteer work. This can also be a great way to discover whole new field of interest. For example, Dr. Garcia recalled a student who had worked with implementation of electronic health records in a community health center, and subsequently chose to attend Duke University because of that institution's policy school. If you're enthusiastic about it and you think it will resonate with the admissions committee, don't hesitate to make it happen.

Dr. Garcia's advice covered a range of topics, but the overall message was clear: you will be as successful in medical school as you choose to be, based on your work ethic, preparation, and attitude. Medical school is the gateway to a career that can be tremendously rewarding. Before you are handed your white coat, however, there will be years of sacrifice, discipline, and never-ending streams of new information to learn and apply. "You really want to want to do this," Dr. Garcia advised the crowd seriously, "because this is gonna hurt you." Learn what you need to learn, ask yourself if you're truly ready, and only then will the time be right to come to medical school.

## **Making a Successful Transition to Graduate School**

You studied exhaustively and excelled on the GREs. You applied to multiple graduate schools and were accepted by many. You went on numerous fun-filled university visits to assess the strength of their graduate programs. You deliberated. And finally, you decided on the best graduate program for your scientific interests and future career goals.

Now what?

The planning and preparation does not stop once you have chosen a graduate school. To be a successful graduate student, you must be proactive, organized, and efficient. Developing these habits starts well before the first day of orientation! At the NIH Graduate and Professional School Fair, Dr. Pat Sokolove, the Deputy Director of the NIH Office of Intramural Training and Education (OITE), suggested three major areas to consider when planning your transition to graduate school: Personal, Science, and Career.

Of course, the primary focus of all graduate programs, and indeed the reason that you are there, is to receive scientific training. However, to be successful in lab, you must have strong support networks and personal outlets in place. To ensure a successful personal transition, Dr. Sokolove suggested moving to the new area well in advance. Think about what you like to do to reduce stress (whether it is running on trails, going to the movies, or eating desserts) and identify places to do these things as soon as you arrive. When possible, try to establish support systems by

meeting people through club sports or religious institutions before you get overwhelmed with graduate school.

Remember that it is common to feel overwhelmed or discouraged as a new graduate student (or indeed throughout the entire graduate program). To guarantee a smooth transition to performing graduate-level science, Dr. Sokolove advised attending all orientation events and meeting everyone in the department, from fellow students to faculty and administration. Make sure to be extraordinarily polite to administrators, as they will be signing off on your thesis one day! Other suggestions to help start your science on the right foot include becoming familiar with program requirements, planning which courses to take, and inquiring about research rotations. Graduate school demands superb time management skills, an ability to balance multiple important responsibilities (such as classes, teaching, and research), and a lot of personal motivation to ensure that you are spending adequate time on your research project in addition to your other activities. As Dr. Sokolove put it, “You can choose how busy you are, but generally you should choose to be very busy.” Don’t forget to prioritize time with your family or an extracurricular interest to maintain sanity!

It is also important to think about long-term career planning from the very beginning. Identify the career and counseling centers at the university, and start contemplating your interests, skills, and values. Many career centers offer personality tests such as the Myers Briggs Type Indicator (MBTI) that can guide you the right direction. Many skills acquired in graduate school are transferrable to the professional realm, such as project management and efficient communication. Identify skill deficiencies in your repertoire and work to improve them. Whenever possible, pursue opportunities to give presentations and attend conferences from the very beginning. This will help you to gain confidence and to start building a network of colleagues. Begin exploring potential careers at an early stage so that you will have time to step back and recalibrate your path if you change your mind.

While the changes associated with transitioning to graduate school can cause both excitement and anxiety, knowing what to expect and preparing ahead of time can help launch you on a successful graduate school journey.

